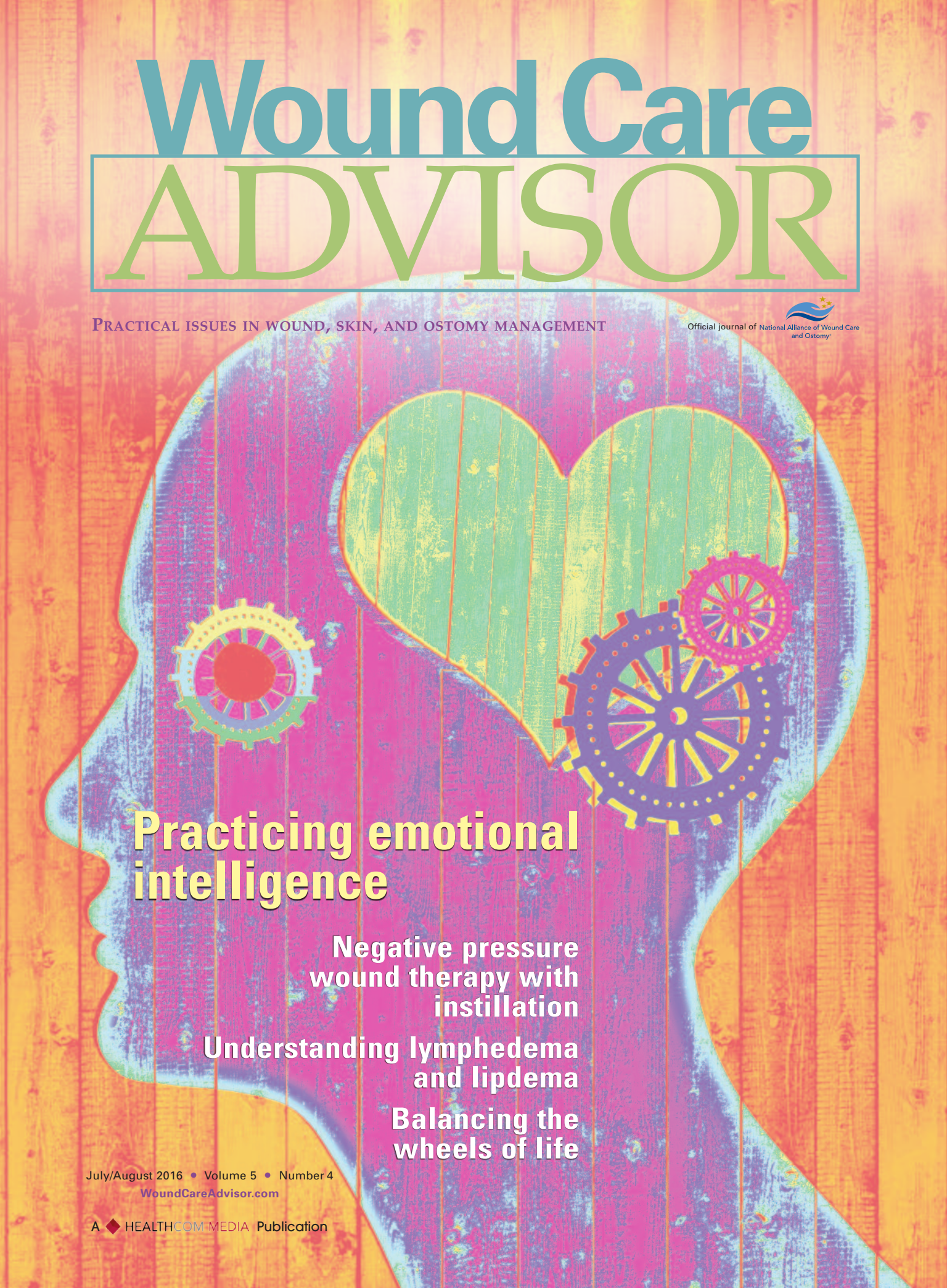
Wound Care ADVISOR

PRACTICAL ISSUES IN WOUND, SKIN, AND OSTOMY MANAGEMENT

Official journal of National Alliance of Wound Care and Ostomy®



Practicing emotional intelligence

Negative pressure wound therapy with instillation

Understanding lymphedema and lipdema

Balancing the wheels of life

July/August 2016 • Volume 5 • Number 4
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1. Ochs RF, Horn SD, et al. Comparison of Air-Fluidized Therapy with Other Support Surfaces Used to Treat Pressure Ulcers in Nursing Home Residents. Ostomy Wound Management, 2005, 51(2):38-68.

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Wound Care Advisor (ISSN 2168-4421) is published by HealthCom Media, 259 Veterans Lane, Doylestown, PA 18901. Printed in the USA.

Editorial Mission: *Wound Care Advisor* provides multidisciplinary wound care professionals with practical, evidence-based information on the clinical management of wounds. As the official journal of the National Alliance of Wound Care and Ostomy®, we are dedicated to delivering succinct insights and information that our readers can immediately apply in practice and use to advance their professional growth.

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CONTENTS

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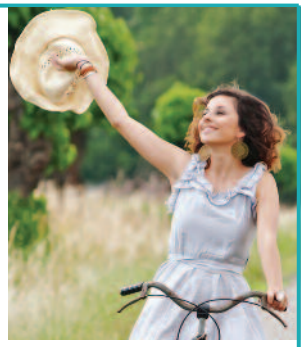

FEATURES

DEPARTMENTS

page 32

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From the EDITOR

Doing it cheaply vs. doing what's best for patients

Sad but true: Much of what we do as healthcare professionals is based on reimbursement. For nearly all the services and products we use in wound care and ostomy management, Medicare, Medicaid, and insurance companies control reimbursement. For many years, these payers have been deciding which interventions, medications, products, and equipment are the best, and then reimbursing only for those items. If we want to use something not on the list, we—or our patients—will have to pay for it out of pocket.

Consequently, many clinicians first check to see if a service or item is covered or reimbursed before even considering whether it's the best choice for the patient. This has resulted in a "do it as cheaply as possible" mentality.

How did we get to the point where we make decisions based primarily on cost? It didn't happen overnight, and we certainly weren't taught this in school. Instead, it has been handed down to us by our employers, who've had to adopt this approach because of payers' policies. None of the best-practice guidelines for wound care mentions reimbursability as the first priority in choosing interventions, products, or medications. Instead, we are guided to assess each individual patient's needs and then select whatever will heal the patient's wound as quickly as possible with minimal pain, distress, and scarring.

The **2010 Affordable Care Act**[A] (ACA) ushered in a new era of pay for performance, rewarding healthcare providers for delivering a higher quality of care and producing better outcomes, instead of reimbursing based on volume of services provided. As each year passes, new phases of the ACA are influencing more decisions that promote a higher quality of care, and other healthcare payers (such as private insurers) are adopting the **pay-for-performance**[B] approach.

As wound and ostomy clinicians, we need to refocus on what we were taught and what our practice guidelines direct us to do—and reflect on why we became wound and ostomy specialists in the first place. Our priority is to heal our patients quickly and effectively. A good starting point is becoming acquainted with the most recent clinical practice guidelines from **AHRQ**[C] and **NPUAP**[D]. Also, we need to **stay educated**[E] on cutting-edge interventions, products, and equipment. This will help us get out of the "How much does it cost?" rut and move toward an environment of improved patient outcomes.

Donna Sardina, RN, MHA, WCC, CWCMS, DWC, OMS
Editor-in-Chief
Wound Care Advisor
Cofounder, Wound Care Education Institute
Plainfield, Illinois

Online Resources

A. www.hhs.gov/healthcare/about-the-law/read-the-law
B. www.medicare.gov/hospitalcompare/linking-quality-to-payment.html
C. www.guideline.gov/search/search.aspx?term=Skin+Care&vocab=MSH&code=&umls=1
D. www.npuap.org/resources/educational-and-clinical-resources/prevention-and-treatment-of-pressure-ulcers-clinical-practice-guideline/
E. www.wcei.net/wow-conference

Clinical NOTES

Management of biofilm recommendations

The *Journal of Wound Care* has published "**Recommendations for the management of biofilm: a consensus document**[A]," developed through the Italian Nursing Wound Healing Society.

The panel that created the document identified 10 interventions strongly recommended for clinical practice; however, panel members noted that, "there is a paucity of reliable, well-conducted clinical trials which have produced clear evidence related to the effects of biofilm presence."

Statins reduce CVD risk in patients with diabetes

Statins reduce the risk of cardiovascular disease (CVD) and death in patients with type 1 diabetes without a history of CVD, according to a study published in *Diabetes Care*.

"**Association between use of lipid-lowering therapy and cardiovascular diseases and death in individuals with type 1 diabetes**[B]" included more than 24,000 individuals from the Swedish National Diabetes Register who were followed for a mean of 6 years.

International diabetes organizations support bariatric surgery

"**Metabolic surgery in the treatment algorithm for type 2 diabetes: a joint statement by international diabetes organizations**[C]," published in *Diabetes Care*, supports including metabolic (bariatric) surgery as a treatment option for people with type 2 diabetes who are obese. The statement notes when metabolic surgery is recommended and when it should be considered.

The 2nd Diabetes Surgery Summit was convened in collaboration with leading diabetes organizations to develop the guidelines. The multidisciplinary group included 48 international clinicians and scholars from leading diabetes associations; 75% were not surgeons. Draft conclusions were presented and opened to public comment. Following comment, they were amended.

Medicare-VHA dual use associated with poorer chronic wound healing

Veterans with chronic wounds who are enrolled in Medicare and access care through Medicare and the Veterans Health Affairs (VHA) experience poorer healing of chronic wounds, according to a study in

Wound Repair and Regeneration.

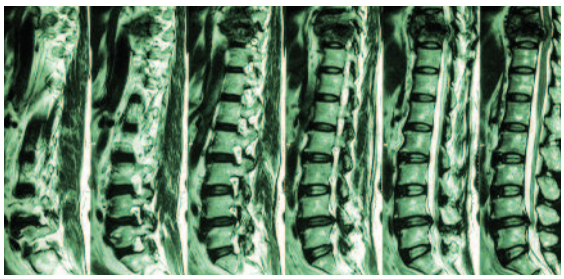
"**Medicare-VHA dual use is associated with poorer chronic wound healing[D]**" was a retrospective study that followed 227 Medicare-enrolled individuals who used the VHA and who had a chronic lower limb wound. Individuals were followed until the wound was healed or up to 1 year.

"Dual use was associated with a significantly lower hazard of wound healing compared to VHA-exclusive use," the study authors note. The risks of amputation or death were higher for dual users.

Sacral dressing may help prevent ulcers in ICU patients

"**Prophylactic sacral dressing for pressure ulcer prevention in high-risk patients[E]**," published in the *American Journal of Critical Care,* reports that the dressing reduced the number of sacral pressure ulcers in three ICUs by 3.4 to 7.6 per 1,000 patient days depending on the unit.

Data were collected for 7 months and compared to 7 months before the dressings were used, and patients were identified as high risk by using an evidence-based tool. The study authors note that heightened awareness by the care team and increased education also are key in preventing pressure ulcers.



Scale has limited ability to predict pressure ulcers

A study that evaluated the Spinal Cord Injury Pressure Ulcer Scale (SCIPUS) during acute care and inpatient rehabilitation following spinal cord injury (SCI) found that the scale could predict pressure ulcers occurring within 2 to 3 days after it was administered in acute care, but didn't predict ulcer development over a longer term within acute or inpatient rehabilitation.

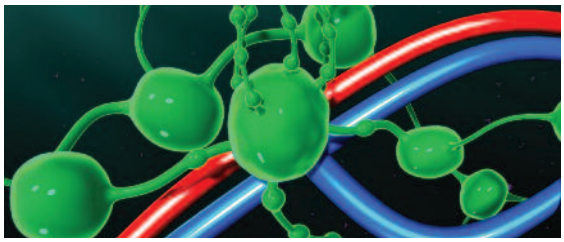
"**Predictive validity of the Spinal Cord Injury Pressure Ulcer Scale (SCIPUS) in acute care and inpatient rehabilitation in individuals with traumatic spinal cord injury[F]**," published in *NeuroRehabilitation*, used retrospective analysis to determine the findings.

Braden Q and Glamorgan scales compared in children

The *Journal of Tissue Viability* has published "**A comparison of the performance of the Braden Q and the Glamorgan paediatric pressure ulcer risk assessment scales in general and intensive care paediatric and neonatal units[G]**," which found that both work

well in these settings.

The study authors note, however, that the Braden Q may be better at predicting risk in general pediatric units. More than 500 pediatric admissions were included in the study.



Axillary reverse mapping may reduce lymphedema

Researchers report that using axillary reverse mapping during surgery to help identify lymph nodes and vessels reduces the risk of lymphedema in patients undergoing sentinel lymph node biopsy and/or axillary node dissection.

A total of 654 patients participated in "**Does axillary reverse mapping prevent lymphedema after lymphadenectomy?**[H]," published in *Annals of Surgery*.

Muslims and QOL after ostomy surgery

Muslims who undergo ostomy surgery experience significant reductions in health-related quality of life (QOL) — greater reductions than seen in non-Muslim patients, according to a study in *Journal of Wound Care and Ostomy*.

"**Quality of life after ostomy surgery in Muslim patients: a systematic review of the literature and suggestions for clinical practice**[I]" notes that factors associated with the difference include "psychological factors, social isolation, underreporting of complications, and sexual dysfunction leading to breakdown of marital relations as well as diminished religious practices."

Chronic venous insufficiency consensus statement

Circulation has published "**Investigation of chronic venous insufficiency: a consensus statement**[J]," which "provides an up-to-date account of the various methods available for the investigation of chronic venous insufficiency of the lower limbs (CVI), with an outline of their history, usefulness, and limitations."

Online Resources

A. magonlinelibrary.com/doi/full/10.12968/jowc.2016.25.6.305
B. care.diabetesjournals.org/content/39/6/996
C. are.diabetesjournals.org/content/39/6/861
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E. ajcc.aacnjournals.org/content/25/3/228.short
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G. sciencedirect.com/science/article/pii/S0965206X16000279
H. ncbi.nlm.nih.gov/pubmed/27163955
I. journals.lww.com/jwocnonline/Abstract/publishahead/Quality_of_Life_After_Ostomy_Surgery_in_Muslim.99822.aspx
J. circ.ahajournals.org/content/102/20/e126.abstract

Instill instead: Negative pressure wound therapy with instillation for complex wounds

This option may be just what's needed for a patient with a complex wound.

By Ron Rock, MSN, RN, ACNS-BC

Negative pressure wound therapy (NPWT) uses negative pressure to draw wound edges together, remove edema and infectious material, and promote perfusion and granulation tissue development. The tissue stretch and compression created by negative pressure during NPWT promotes tissue perfusion and granulation tissue development through angiogenesis, cellular proliferation, fibroblast migration, increased production of wound healing proteins, and reduction of wound area. NPWT has been used to improve healing in a variety of wounds, including traumatic injuries, surgical wounds, pressure ulcers, diabetic foot ulcers, and venous stasis ulcers.

NPWT has now evolved to include automated instillation with dwell time (NPWTi-d, V.A.C. VERAFLO™ Therapy, KCI, an ACELITY Company, San Antonio, TX) that provides wounds with the benefits of both NPWT and wound irrigation. Wound irrigation is an effective, commonly used method to remove debris and infectious material as a means to promote wound healing. This article provides an overview of NPWTi-d.

Support for NPWTi-d

NPWTi-d has been used to treat many different wound types, including traumatic injuries, dehisced surgical wounds, pressure ulcers, diabetic foot ulcers, venous stasis ulcers, and burns. Studies report that NPWTi-d, compared to NPWT alone, decreases the number of surgical debridements, length of hospital stay, and length of treatment. These studies also report improved granulation tissue production and filling of undermined cavities. One study detailed the use of NPWTi-d as adjunctive treatment for bioburden management.

When to use (and not use)

NPWTi-d is primarily indicated for wound cleansing or to promote granulation tissue formation. (See *Wound characteristics and NPWTi-d therapy goals*.)

NPWTi-d is contraindicated for patients with:

- a wound malignancy
- untreated osteomyelitis
- nonenteric and unexplored fistula
- necrotic tissue with eschar.

The treatment also shouldn't be used with Octenisept® (Schülke and Mayr GmBH, Norderstedt, Germany), hydrogen peroxide, or alcohol-based solutions, or to deliver fluid into the thoracic or abdominal cavity because of the risk to alter core body temperature and cause fluid retention within the cavity. In addition, each wound should be thoroughly explored for intactness before starting NPWTi-d to avoid instilling topical solutions into adjacent body cavities.

Clinical considerations

Several wound irrigation solutions have been recommended for use with NPWTi-d. (See *Instillation therapy settings*). Common wound cleansers include normal saline, quarter strength (0.125%) or 0.0125% (one-tenth the concentration of quarter strength due to cytotoxicity) Dakin's solution, super-oxidized water with neutral pH (Microcyn®, Oculus Innovative Sciences, Petaluma, CA), 0.5% sliver nitrate, and 0.01% polyhexanide (Prontosan® Wound Irrigation Solution, B. Braun Medical, Bethlehem, PA).

Concerns have been raised in Europe regarding polyhexamethylene biguanide (PHMB), a component of 0.01% polyhexanide. It was classified as a cancer-causing agent in concentrations of 1.0% or higher. However, 0.01% polyhexanide contains PHMB in extremely low concentrations (0.1%) diluted with betaine and purified water, so the carcinogenic classification does not apply.

Here are tips to ensure patients receive the optimal benefit from NPWTi-d:

- Become familiar with how to operate the pump. Getting used to the format may require a learning curve.
- Understand that NPWTi-d foam has higher tensile strength than traditional black NPWT foam to facilitate its easier removal from the wound bed and un-

Wound characteristics and NPWTi-d therapy goals

Wound characteristic	NPWTi-d therapy goal
Exudative	Cleanse
Necrotic	Cleanse
Infected	Cleanse
Contaminated/colonized	Cleanse
Malodorous	Cleanse
Stalled healing	Cleanse
Pain	Cleanse
Tissue loss	Granulation
Tunneling	Granulation
Desiccated	Granulation
Hypoxic wound bed	Granulation
Edematous	Granulation

Adapted from Gupta S, Gabriel A, Lantis J, et al. Clinical recommendations and practical guide for negative pressure wound therapy with instillation. *Int Wound J.* 2016;13(2):159-74.

Instillation therapy settings

		Instillation therapy settings		
Solution type	**Solution**	**Dwell time (per day)**	**Dwell frequency**	**NPWT**
Biguanides	Polyhexanide 0.01% (Prontosan)	1-60 seconds	12-24 times	1-2 hours
Isotonic	Normal saline (Sodium chloride 0.9%)	1 second-10 minutes	2-24 times	1-12 hours
Hypochlorite based	Dakin's solution (Quarter strength, 0.125%)	5-10 minutes	6-24 times	50 minutes-4 hours
Hypochlorous acid	Super-oxidized water with Neutral pH (Microcyn)	5-10 minutes	6-12 times	2-4 hours
Silver nitrate	Silver nitrate (0.5%)	1 second	12 times	2 hours

Adapted from Gupta S, Gabriel A, Lantis J, et al. Clinical recommendations and practical guide for negative pressure wound therapy with instillation. *Int Wound J.* 2016;13(2):159-74

Case study of NPWTi-d

Mary Johnson*, a 51-year-old woman, developed a large abdominal wound after a prolonged hospital stay and multiple surgeries. Ms. Johnson had a history of ulcerative colitis, proctitis, morbid obesity (body mass index > 60 kg/m^2), acute kidney injury, deep vein thrombosis, and rectal cancer. (*Note:* Malignancy is a contraindication for NPWT unless the site is known to be free of cancer. This was an abdominal wound with no malignancy, so it was safe to treat with NPWTi-d).

A. Ms. Johnson's wound on presentation. The wound was examined with the patient under anesthesia and multiple debridements were performed. Blood and wound cultures were obtained and were positive for infection. Systemic antibiotic therapy and NPWTi-d were initiated.

B. NPWTi-d in place on the wound. The NPWTi-d settings were as follows: 55 mL of quarter strength Dakin's solution was used with a 10-minute soak, followed by 3.5 hours of NPWT at -125 mm Hg. Ms. Johnson received 2 weeks of therapy.

C. Note the extent of Ms. Johnson's nonviable tissue. After NPWTi-d therapy, she was discharged to a long-term acute care center with conventional NPWT (continuous NPWT at -125 mm Hg).

*Name is fictitious.

dermined cavities. It's also less hydrophobic, which helps to evenly distribute the wound irrigation solutions.

- For very large wounds, traditional black foam may be used in addition to the NPWTi-d foam to fill large wound cavities. If an additional drape is needed, a traditional drape may be used; however, the NPWTi-d drape is specifically designed to provide enhanced moisture-resistant adhesion along the wound edges to minimize irrigation solution leakage.
- In large wounds, it's important to keep a running tally of the number of foams used. This will ensure their complete removal during dressing changes and when treatment has been completed.
- Periwound skin is fragile, so take care to protect it before treatment is started. Foam dressings should not come into contact with intact skin. Application of skin preparation products, an additional drape, hydrocolloid dressings, or transparent film over the periwound skin is recommended.
- Know that NPWTi-d can be used with bridging techniques if needed. Use careful attention to ensure the wound cavity is not overfilled, as additional irrigation solution will be required.
- Ensure a good seal because leaks could alter the amount of instillation volume and the negative pressure delivered to the wound and lead to a leak alarm. Apply gentle traction to skin creases and folds to obtain a flat surface for optimal drape adhesion. Apply the drape carefully, avoiding creases or puckering of the drape even in areas where they may overlap. Drape wrinkles may create small, unidentifiable passages for air to enter along the skin or in sections where the drape is overlapped into the foam as the negative pressure is initiated, which could cause a leak alarm. Applying a thin strip of additional drape along the existing edges or a silicone-based skin prep on the overlapped sec-

tions of drape may help achieve a good seal.

- Confirm that both the NPWTi-d cassette and canister are fully engaged and latched. Inappropriate placement or latching of the cassette and canister will cause errors in treatment application.
- Check that the NPWTi-d cassette tubing is not kinked, crimped, or blocked and that all clamps are open. This will allow the instillation fluid to be delivered easily into the wound bed.
- Remember that NPWTi-d canisters usually fill more quickly when combining wound drainage with the instilled solutions, so have extra canisters on hand to alleviate this problem. The unit will alarm when the canister is full.
- As the wound improves and the wound dimensions decrease, reduce the amount of solution instilled accordingly. Overfilling the wound may lead to a compromised seal and solution leakage.
- If possible, have an extra bag of prescribed irrigation solution on hand. Solutions other than normal saline will come from the pharmacy. Use quarter strength (0.125%) Dakin's solution to minimize cytotoxicity. The pump will alarm when the solution bag is empty.
- Remember that you do *not* need to prime the line when spiking a new solution bag.
- Become familiar with the settings. The home screen on the unit will display the current NPWTi-d phase (Instill, Soak, or NPWT) with a timer indicating time remaining in that particular phase.
- Be aware of any discrepancy between the amount of prescribed solution instilled into the wound and the amount of solution returning into the drainage canister. Decreased or no return of solution may indicate transmission into an internal cavity. If this is the case, immediately stop instillation and notify the prescribing clinician.
- Understand that there is a learning curve with using NPWTi-d. Estimating the amount of solution to be instilled will vary. I have noticed a slight predisposition to overfilling. As such, I have taken 20% off the suggested instillation volume and continue to have success.

See *Case study of NPWTi-d* for an example of how this treatment can benefit patients.

An optimal patient experience

NPWTi-d helps remove infectious materials and promotes a wound-healing environment by combining the wound management benefits of NPWT and wound irrigation. Obtaining a complete drape seal, achieving appropriate attachment of canisters and cassettes, maintaining an open instillation solution line, and monitoring levels of fluid instilled and returned can contribute to a more comfortable patient treatment experience. ■

Ron Rock is the nurse manager and clinical nurse specialist for the WOC nursing team in the Digestive Disease Surgical Institute of the Cleveland Clinic in Cleveland, Ohio. R. Rock is a consultant for KCI, an ACELITY Company.
The author thanks Julie M. Robertson, PhD (ACELITY) for assistance in the preparation and editing of this manuscript.

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Balancing the wheels of life

How to ride through life more smoothly

By Tracey Long, PhD, MS, MSN, RN, CDE, CNE, CHUC, CCRN

Have you ever ridden a bicycle with a wobbly wheel? The ride isn't smooth, and you notice every bump in the road. As you focus on your discomfort, you may be distracted from the beautiful vistas you're riding past.

Think of the bicycle as your overall health, which carries you through life. For most of us, learning how to ride a bike begins in childhood as we learn to control the wheels. But with more wear and tear on the bike, the once-pleasant ride becomes uncomfortable and sometimes out of balance.

As clinicians, we need not just to practice riding our own bicycles gracefully, but also to care for our patients' worn and hurt bikes. Only by being balanced yourself can you truly help another.

Living a balanced, healthy life means finding joy in the journey. Unfortunately, our mortal existence comes with bumps in the road. In our fast-paced society that requires us to juggle family, professional, and other demands, many of us seem compelled to ride faster. But this may not be effective or productive—and it can lead to distress.

The wheel as metaphor

One way to find a balance is to examine the wheels that carry you through life. Each wheel has many spokes; think of the section within each spoke as one of the areas of life that together make up your whole well-being. One section represents your physical health and the others your spiritual, mental, social, environmental, financial, recreational, and emotional health.

Now imagine the center of each spoke is a zero and the outer rim is a 10; from the center to the rim, the numbers increase. How would you rank yourself in each area of life, with 0 representing the lowest ranking and 10 the highest? Put a dot on the number that represents how strong you think you are in each area of your life. Giving each section a numeric value helps you identify problems so you can move toward a plan for improvement. For most people, the numbers will vary from section to section, because most of us feel stronger in some areas of life than in others.

Next, connect the dots around your wheel to see how bumpy the wheel is. If you assigned a 4 to some parts of your life but gave others a 2 or an 8, the connected dots would create an irregular wheel. When you look at your wheel as a whole, you're examining how bumpy or out of balance

your life may be. With this wheel, would your ride through life be smooth or bumpy? Using this tool can help you identify why your ride seems out of balance and can pinpoint which areas need improvement.

Using SOAP to clean your bike

Clinicians often use the acronyms SOAP and SOAPIER to guide the nursing or patient care process.

- **SO** stands for subjective and objective data—the process of collecting important information about a potential or real problem.
- **A** stands for assessment, the second step. Being able to label a problem helps you recognize the reality of your situation.
- With that information, you can create a plan, represented by **P**, to address the problem.
- The additional steps of intervention, evaluation, and reevaluation (the IER of SOAPIER) can guide you through the cyclic nature of the process.

Improving the numbers on your wheel

Similarly, we can keep ourselves in balance by using the patient care process on our wheels—and by extension, ourselves. During the assessment step, examine the ratings you gave to each wheel section to gauge the status of each area of your life. Then ask yourself the following questions:

- What would it take for me to move from a 4 to a 5, or from a 6 to a 7, in this area?
- What one action could I take today to improve this rating?
- Am I willing to do this?
- What are the barriers to improving my rating in this area?
- What resources do I have or need to have to improve the rating in this area?

Joy in the journey

By using the SOAP process on your own wheels that carry you through life, you can make your ride less jarring. When we're in balance, our ride through life is much smoother and we can enjoy the journey more. When you're balanced and stable, you can run aside the wobbly bikes of struggling patients—and use the bicycle analogy to help them identify imbalances in their own health and lives.

Holistic practice helps individuals find meaning and balance in their lives. Health is more than just absence of disease. It refers to our emotional, physical, spiritual, social, and environmental well-being. A problem in any one area can affect the whole.

Striving for balance in life is a constant challenge. The terrain changes with the seasons and demands of life. Sometimes just keeping perspective on the road ahead helps you realize that despite the hills and valleys, your wheels are in balance and you just need to keep pedaling. By applying the patient care process to ourselves, we can adjust our wheels and better enjoy the ride. Savor the journey. ■

A certified nurse educator and certified diabetes educator, Tracey Long is also on the faculty of Nevada State College in Las Vegas.

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Understanding NPUAP's updates to pressure ulcer terminology and staging

By Jeri Lundgren, BSN, RN, PHN, CWS, CWCN

On April 13, 2016, the National Pressure Ulcer Advisory Panel (NPUAP) announced changes in pressure ulcer terminology and staging definitions. Providers can adapt NPUAP's changes for their clinical practice and documentation, but it's important to note that, as of press time, the Centers for Medicare & Medicaid Services (CMS) has not adopted the changes. This means that providers can't use NPUAP's updates when completing CMS assessment forms, such as the Minimum Data Set (MDS) or Outcome and Assessment Information Set (OASIS). Instead, they must code the CMS assessment forms according to current CMS instructions and definitions. In addition, there is no ICD-10 code for pressure injury.

In a nutshell

Here are the key overall changes made by NPUAP:

- The term "pressure injury" replaces "pressure ulcers."
- Arabic numbers replace Roman numerals in the names of the stages.
- The term "suspected" has been removed from the Deep Tissue Injury diagnostic label.
- Additional pressure injury definitions were added for medical device related pressure injury and mucosal membrane pressure injury.

- The staging system definitions were updated.

The NPUAP updated terminology and staging system definitions are listed below.

Pressure injury

A pressure injury is localized damage to the skin and/or underlying soft tissue, usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities and condition of the soft tissue.

Stage 1 pressure injury: Non-blanchable erythema of intact skin

Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.

Stage 2 pressure injury: Partial-thickness skin loss with exposed dermis

Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an in-

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tact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough, and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture-associated skin damage (MASD), including incontinence-associated dermatitis (IAD), intertriginous dermatitis (ITD), medical-adhesive related skin injury (MARSI), or traumatic wounds (skin tears, burns, abrasions).

Stage 3 pressure injury: Full-thickness skin loss
Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage, and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss, this is an unstageable pressure injury.

Stage 4 pressure injury: Full-thickness skin and tissue loss
Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage, or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining, and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss, this is an unstageable pressure injury.

Unstageable pressure injury: Obscured full-thickness skin and tissue loss
Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a stage 3 or stage 4 pressure injury will be revealed. Stable eschar (i.e., dry, adherent, intact without erythema or fluctuance) on an ischemic limb or the heel(s) should not be removed.

Deep tissue pressure injury: Persistent non-blanchable deep red, maroon, or purple discoloration
Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, or purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle, or other underlying structures are visible, this indicates a full thickness pressure injury (unstageable, stage 3, or stage 4). Do not use deep tissue pressure injury to describe vascular, traumatic, neuropathic, or dermatologic conditions.

More definitions

Below are additional pressure injury definitions.

Medical-device related pressure injury:
This describes an etiology. Medical-device related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant

pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.

Mucosal membrane pressure injury: Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury. Due to the anatomy of the tissue, these injuries cannot be staged.

Next steps

Providers should carefully consider how these changes will affect their clinical and reimbursement systems. It's important to tell staff what definitions and terminology the organization will use for clinical practice, documentation, and completing CMS-mandated assessment forms.

Access **free resource: staging illustrations**[A] from the NPUAP website.

Jeri Lundgren is the president of Senior Providers Resource in Cape Coral, Florida. She can be contacted at jeri@seniorprovidersresource.com.

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Practicing emotional intelligence may help reduce lateral violence

By Tara Slagle, MSN, BSN, RN

It's been a stressful day at work—nothing new. One confused patient pulled off her ostomy bag, you're having difficulties applying negative-pressure wound therapy on another, and a third patient's family is angry with you. We all experience stressful days, but unfortunately, sometimes we take our stress out on each other. Too often, this ineffective way of identifying and managing stress leads nurses to engage in lateral violence.

Lateral violence is identified and described by the American Nurses Association as acts between colleagues that include covert or overt aggression. These acts of displaced stress can create a tense work environment and psychological anguish, and may even lead some clinicians to quit their jobs or abandon their profession all together. The unnecessary outcomes of lateral violence require that we, as professionals, proactively seek out meaningful methods to identify and reduce its formation and occurrence. The first step in this endeavor is to examine and develop our emotional intelligence (EI).

What is EI?

EI is the ability to understand and control our own emotions while reading and adjusting to the emotions of others. The behaviors and traits of people who have high EI levels are also those of people who are less likely to engage in lateral violence. There are other benefits, too. For example, a study conducted with ICU nurses demonstrated that EI education increased nurses' general health.

Improving EI skills

A study by Sharif and colleagues reported that EI can be taught, meaning we all have the potential to increase our self-awareness, self-regulation, and empathy. Strengthening these aspects of EI can help us to not only understand ourselves, but also how our emotions impact our colleagues.

The first step is to educate ourselves about EI. Next, we must adapt our daily culture to incorporate EI into our practice. Clinicians are, after all, nothing if not adaptable. We have gone from paper charting to electronic charting, from wet-to-dry dressings to better wound care options, and from provider-centered interventions to patient-centered, evidence-based practice.

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This adaptation requires the use of three tools: purposeful reflection, improvisation, and empathy.

Purposeful reflection

Self-awareness occurs when we engage in purposeful reflection, viewing a situation from multiple angles with the intent to learn and improve decision making.

Take a moment to think about a recent situation when an interaction or conversation did not go well. What started it? What were you feeling at the time? Did you have a long day at work? Did you expect this person to say something you didn't want to hear? Did someone approach you and demand an immediate conversation?

Now remove yourself from that moment and think of yourself as another person looking in. If you removed the emotions, what was that conversation truly about? Was fear involved? Were you put in a situation that should have been handled at another time? Reflecting purposefully on the situation enables you to recognize the irrational responses.

Purposeful reflection also enables you to identify negative patterns, called triggers. Learning to recognize triggers may prevent unfavorable situations or reactions. Purposeful reflection, when done consistently, will aid in reducing negative energy, cut short the conflict, and possibly prevent tense situations. Once you make purposeful reflection a habit, you can then use improvisation to process conflicts on the spot and provide thoughtful feedback.

Improvisational skills

Applying improvisation skills can help us to control our emotions and can teach us to notice the difference between reactive words and thoughtful words. Here are the steps of improvisation in a situation:

1. Be present in the conversation. This can be achieved by counting to 10 before speaking. Counting to 10 releases the limbic system of the body from the flight or fight emotion, so we can be more thoughtful.
2. Listen to the other person in the situation.
3. Eliminate bias and establish an objective or overall goal for the situation. For example, in nursing we may need to stop thinking how the situation affects us and think about how it affects the patient.
4. Be encouraging even if you don't agree with someone. Try to find a positive spin on another person's view before sharing your own opinions.
5. Seek to provide the necessary feedback that will allow the other person to walk away knowing they were heard, whether or not an agreement was made.

Once you've honed the tools of purposeful reflection and improvisation, you can develop a stronger sense of empathy.

Empathy

Empathy, the process of walking in another's shoes, moves us away from focusing on ourselves and towards thinking about the needs of others. It is a fundamental aspect of social interaction. As nurses, we consistently do this with our patients, but rarely do it with our coworkers. If the previous shift's staff caused a problem that you want to discuss with them, you must protect yourself from letting your emotions become reactive and ask yourself, "Why am I so angry?"

Empathy begins with listening. Begin to discuss the situation with the nurse from the last shift by asking an open-ended

question. For example say, "How was your night?" Then listen: Your coworker may share that he or she had a significant problem on the shift. Follow through with the conversation to better understand why this coworker was unable to complete a task or complete a task correctly. Do not listen to solve a problem or to think about how this affects you, but rather listen with an open mind as it may present an opportunity to learn or an opening to pose clarifying questions.

An agent of change

By developing and sharing the tools of EI—purposeful reflection, improvisation, and empathy—you can be an agent of change. Being a leader has many challenges, but when others see how calmly you manage yourself, aggressive coworkers, and tense situations, they will be inspired. ■

Tara Slagle is a course mentor for Western Governor's University in Salt Lake City, Utah, and a clinical educator at Hanover Hospital in Hanover, Pennsylvania.

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Assessing footwear in patients with diabetes

By Nancy Morgan, RN, BSN, MBA, WOC, WCC, DWC, OMS

Each issue, *Apple Bites* brings you a tool you can apply in your daily practice. This issue, we focus on footwear for patients with diabetes.

Inappropriate footwear is the most common source of trauma in patients with diabetes. Frequent and proper assessment of appropriate footwear is essential for protecting the diabetic foot from ulceration.

Here is a step-by-step process for evaluating footwear. Be sure to evaluate footwear with the patient walking, standing, and sitting.

Observe wear patterns for areas of high pressure or abnormalities

- Check the inside of shoe, upper area, and soles.
- Check that pressure under the sole of the shoe is even, so no one part wears out excessively.
- Assess wear. Normal wear should occur at the lateral heel and medial central forefoot; there also may be slight curvature on the undersurface of the sole at the toe area.

Inspect inside of the shoes

- Observe and feel for wrinkled lining, protruding rough seams, and foreign objects.
- Observe for drainage on the insole or socks.
- Check that soles are sufficiently thick to prevent puncture wounds.
- Ensure that shoes have supportive, cushioned soles, with nonslip liners to absorb shock and reduce pressure under the feet.

Observe for correct fit

- Check for sizing. In general, there should be about a thumbnail (approximately ½ to ¾ inch) distance between the end of your longest toe and the tip of the shoe.
- Check heel-to-ball length:
  - Measure the distance from the patient's heel to the first and fifth metatarsal heads.
  - Bend the shoe to determine toe break and repeat the measurement on the other shoe.
  - The two measurements should be close to the same.
- Check width. The sides of the shoe should not compress the sides of the foot, with the shoe fitting snugly but not tightly. The widest part of foot should be in the widest part of shoe. The correct width allows the

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Tips for buying shoes for patients with diabetes

1. When buying shoes, make sure they are comfortable from the start and have enough room for your toes.
2. Don't buy shoes with pointed toes or high heels. They put too much pressure on your toes. The heel should be no more than ¾ inch high.
3. Have your foot measured each time you buy shoes. Stand during the measurement.
4. Shop late in the day, when your feet are largest.
5. Know that size varies depending on the manufacturer. Always try more than one size to find the best fit.
6. Try on both shoes and walk around to check comfort. Base fit on the larger foot.
7. Allow at least a thumbnail (about ½ to ¾ inch) of space at the end of your longest toe in the shoes you select. Make sure you can wiggle your toes.
8. Try the shoes on with the type of socks you will wear.
9. Choose leather uppers, a stiff heel, inside cushioning, and flexibility for the ball of the foot.
10. Select the best material. The outer sole should be made of soft material with laces or Velcro tabs.
11. For serious foot problems, buy a shoe that is specially molded to your foot.

It's always a good idea to have a healthcare professional check the fit of your shoes.

toes to rest flat on the insole without being compressed.

- Verify that there is no rubbing of the feet or slipping in the shoe and that the heel cup fits snugly.
- Be sure the shoe follows the natural outline of the foot.
- Observe for a secure fastening mechanism, which should be adjustable with laces, Velcro, or buckles.

Observe that socks are being worn with shoes to reduce friction

- Check that socks meet the following criteria:
  - Socks are nonconstricting with no tight band around ankle or calf.
  - Socks with prominent seams are worn turned inside-out.
  - Socks are made of absorbent materials, such as cotton.
  - Lighter-colored or white socks are worn when there is an open wound to help alert wearers with compromised sensation to a draining wound.
- Check that socks meet individual patient needs:
  - Patients with a partial foot require a sock that will conform to the shape without distal prominent seams or excess material at the distal end.
  - For active patients, socks can be obtained with silicone over high-stress areas to prevent shear for full or partial feet.

Inspect shoes to determine if they meet the characteristics for the ideal diabetic foot shoe

- The shoe is foot-shaped and has a soft heel counter to keep the foot in place.
- The shoe upper is made of leather or other breathable material.
- The leather over the forefoot is as soft as possible.
- The inside lining of the shoes is smooth and free from seams and/or wrinkles.

continued on page 30

Lymphedema and lipedema:
What every wound care clinician should know

These conditions can cause both psychological and physical problems.

By Heather Hettrick, PT, PhD, CWS, CLT, CLWT

Imagine you have a health condition that affects your life every day. Then imagine being told nothing can be done about it; you'll just have to live with it. Or worse yet, your physician tells you the problem is "you're just fat."

Many people with lymphedema or lipedema have no idea their condition has a name or that many other people suffer from the same thing. Although lymphedema and lipedema can't be cured, proper management and resources can help patients cope. This article improves your grasp of these conditions, describes how to recognize and manage them, and explains how to support your patients.

To understand lymphedema and lipedema, first you need to understand how the lymphatic system functions. It makes lymph, then moves it from tissues to the bloodstream. It also plays a major role in the immune system, aiding immune defense. In addition, it helps maintain normal fluid balance by promoting fluid movement from the interstitial tissues back to the venous circulation. (See *Lymphatic system: Four major functions.*)

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If the lymphatic system is impaired from a primary (hereditary or congenital) condition or a secondary problem, lymphedema can result. In this chronic, potentially progressive, and incurable condition, protein-rich fluid accumulates in the interstitial tissues.

Lymphatic system: Four major functions

The lymphatic system serves these functions:

- returns plasma and plasma proteins that have escaped from small vessels into the blood circulation
- acts as a safety valve for fluid overload to help prevent edema; as interstitial fluid increases, fluid pressure rises, boosting local lymph flow
- maintains homeostasis of the extracellular environment by removing excess protein molecules and waste from interstitial fluid
- cleanses interstitial fluid and blocks the spread of infection and malignant cells in the lymph nodes.

Lymphedema basics

Lymphedema occurs in four stages.

Stage 0. During this stage (also called the subclinical or latency stage), transport capacity of the lymphatic system decreases but remains sufficient to manage normal lymphatic loads. Signs and symptoms aren't evident and can be measured only by sensitive instruments, such as bioimpedance spectroscopy and optoelectronic

volumetry. Without such instruments to quantify volume changes, diagnosis may rest on subjective complaints.

In this stage, limited functional reserve of the lymphatic system leads to a fragile balance between subnormal transport capacity and lymphatic loads. Added stress on the lymphatic system (as from extended heat or cold exposure, injury, or infection) may cause progression to stage 1.

Providing appropriate patient information and education, especially after surgery, can dramatically reduce the risk that lymphedema will progress to a more serious stage.

Stage 1. Considered the spontaneously reversible stage, stage 1 is marked by soft-tissue pliability without fibrotic changes. Pitting can be induced easily. In early stage 1, limb swelling may recede overnight. With proper management, the patient can expect the extremity to decrease to a normal size compared to that of the uninvolved limb. Otherwise, lymphedema is likely to progress to stage 2.

Stage 1 lymphedema may be hard to distinguish from edemas from other causes. Clinicians must rely on the patient history and monitor for swelling resolution with conventional management, such as compression and elevation, or note if swelling persists despite these standard interventions.

Stage 2. Sometimes called the spontaneously irreversible stage, stage 2 is identified mainly from tissue proliferation and subsequent fibrosis (called lymphostatic fibrosis). The fluid component can be removed spontaneously, but removal of the increased tissue proliferation (initially irreversible) takes more time. Tissue proliferation stems from long-standing accumulation of protein-rich fluid; over time, the tissue hardens and pitting is hard to induce. In many cases, swelling volume increases, exacerbating the already compromised local immune defense.

Consequently, infections (particularly cellulitis) are common; these, in turn, increase the volume of the affected area. Proper treatment can reduce volume.

With proper care (complete decongestive therapy [CDT]), lymphedema can stabilize during stage 2. But patients with chronic or recurrent infections are likely to progress to stage 3.

Stage 3. Also called lymphostatic elephantiasis, this stage is marked by further fluid volume increases and progression of tissue changes. Lymphostatic fibrosis becomes firmer and other skin alterations may occur, including papillomas, cysts, fistulas, hyperkeratosis, fungal infections, and ulcers. Pitting may be present. Natural skinfolds deepen (especially those of the dorsum of the wrist or ankle) and, in many cases, cellulitis recurs.

If lymphedema management starts during this stage, reduction can still occur. Even in extreme cases, with proper care and patient adherence to treatment, lymphostatic elephantiasis can be reduced so the leg is a normal or near-normal size.

Assessment and diagnosis

A thorough physical examination is the gold standard for diagnosing lymphedema. A complete patient history, body-systems review, inspection, and palpation can help determine if edema is lymphedema.

Clinically, the only test with proven reliability and validity in diagnosing lymphedema is the Stemmer sign. Fibrotic changes associated with lymphedema can lead to thickened skin over the proximal phalanges of the toes or fingers. If you can't tent or pinch the skin on the involved extremity, lymphedema is present (a positive Stemmer sign). However, a negative finding (soft, pliable tissue) doesn't rule out

lymphedema because the condition may be in an early stage, before tissue proliferation and fibrosis have set in.

Management

Although incurable, lymphedema can be managed successfully through CDT. This approach involves proper identification of lymphedema, manual lymph drainage, skin and nail care, patient education, compression, and exercise.

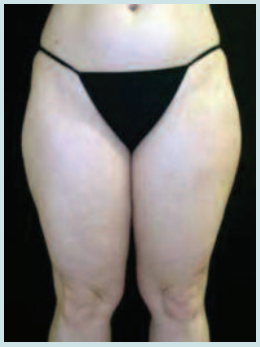
CDT has two phases:

- **Phase I**, the intensive phase, continues until the extremity has decongested or reached a plateau. The clinician provides treatments and educates the patient about all aspects of CDT to prepare him or her for phase II. Phase I can last several weeks to several months depending on lymphedema severity.
- **Phase II**, the maintenance phase, begins once the extremity has decongested or plateaued. This phase still focuses on CDT, but now the patient, not the clinician, is responsible for all care. The goal is to reduce limb size while enabling the patient to become self-sufficient in managing lymphedema. Although CDT can bring significant improvements in limb size, skin quality, and function, patients must remember that phase II continues lifelong. Be sure to provide education about ongoing self-management strategies.

Lipedema stages

Lipedema occurs in three stages.

- Stage 1: Skin appears flat with an enlarged subcutis (connective tissue layer beneath the dermis). On palpation, it may feel like styrofoam balls in a plastic bag.



- Stage 2: Walnut- to apple-like indurations may develop, and the overlying skin takes on an irregular appearance, similar to that of a mattress.

- Stage 3: Larger indurations and deforming fat deposits occur.

Photos courtesy of Caroline Fife, MD

Lipedema: The disease they call "fat"

Lipedema is a painful disorder of fat deposition. Pathologic deposition of fatty tissue (usually below the waist) leads to progressive leg enlargement. Like lymphedema, lipedema is incurable but manageable. Unless managed properly, lipedema can reduce mobility, interfere with activities of daily living, and lead to secondary lymphedema. (See *Lipedema stages*.)

Lipedema commonly is misdiagnosed as lymphedema. However, lymphedema involves protein-rich fluid, whereas lipedema is a genetically mediated fat disorder. Because lipedema resists diet and exercise, it can lead to psychosocial complications. Lipedema occurs almost exclusively in women; typically, onset occurs between puberty and age 30. One unpublished epidemiologic study puts lipedema incidence in females at 11%. Some patients have a combination of lipedema and lymphedema. (See *Viewing lipolymphedema*.)

Viewing lipolymphedema

In lipolymphedema, lipedema takes on a lymphedema component. In the patient shown here, one leg is larger than the other, consistent with the asymmetrical presentation of lymphedema involving both legs. Also, the leg is shaped like a pantaloon, consistent with lipedema. The feet are relatively spared, as in lipedema, but the patient has a positive Stemmer's sign, indicating lymphedema from fibrotic changes. Based on these findings, this patient most likely has lipolymphedema.

Photos courtesy of Caroline Fife, MD

Assessment and diagnosis

As with lymphedema, lipedema diagnosis rests on clinical presentation. Lipedema characteristics include bilateral and symmetrical involvement, absence of pitting (because lipedema isn't a fluid disorder), soft and pliable skin, and filling of the retromalleolar sulcus (called the fat pad sign.)

Photo courtesy of Caroline Fife, MD

Key signs and symptoms include:

- feeling of heaviness in the legs (aching dysesthesia)
- easy bruising

Photo courtesy of Caroline Fife, MD

- sensitivity to touch (called "painful fat syndrome")
- orthostatic edema
- oatmeal-like changes to skin texture.

Nearly half of lipedema patients are overweight or obese, but many appear of normal weight from the waist up. Essentially, the upper and lower extremities don't match. The lower extremities typically show fatty deposits extending from the iliac crest to the ankles, sparing the feet. (See *Lipedema patterns.*)

Photo courtesy of Caroline Fife, MD

Management

Lipedema is best

Lipedema patterns

Typically, fatty deposition in lipedema takes one of four patterns:

- entire leg from ankle to waist
- thighs only
- calves only
- lower leg from ankle to knee.

Lipedema also may be described as columnar, pantaloon, or riding breeches, based on the shape of the patient's legs.

columnar

pantaloon

riding breeches

Photos courtesy of Caroline Fife, MD

Differentiating lymphedema and lipedema

This chart compares the pathophysiologic and clinical features of lymphedema and lipedema.

Feature	Lymphedema	Lipedema
Cause	Primary or secondary lymphatic malfunction or dysfunction	Pathologic deposition of fatty tissue leading to progressive leg enlargement
Pattern	Asymmetrical	Symmetrical
Regions involved	Feet and other body regions	Usually limited to lower legs, but with feet spared
Pitting	Pitting edema in early stages; nonpitting or hard tissue in later stages	Pitting absent; tissue feels rubbery
Stemmer sign	Positive	Negative
Pain	Generally not painful to the touch	Painful to the touch
Bruising	Generally no bruising	Easy bruising
Fibrosis and inflammation	Common	Rare
Hormonal disturbances	Not present	Frequently present
Chronic venous insufficiency	Common	Possible

managed through weight control, as additional weight gain through adipose tissue tends to deposit in the legs. For patients with concomitant lymphedema (lipolymphedema), modified CDT helps reduce and manage lymphatic compromise. To address excess fat deposition, newer "wet" liposuction techniques have proven beneficial. These techniques gently detach adipose cells from the tissue, helping to preserve connective tissue and lymphatic vessels.

Know what to look for

In both lymphedema and lipedema, early identification and proper diagnosis are key. (See *Differentiating lymphedema and lipedema*.) A thorough history and physical exam will likely lead to an accurate diagnosis, if clinicians know what to look for. Proper diagnosis and treatment can prevent expensive and ineffective interventions, which can negatively affect both the patient's condition and psychological well-being. ■

Heather Hettrick is an associate professor at Nova Southeastern University, Department of Physical Therapy in Fort Lauderdale, Florida.

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continued from page 24

- The shoe has a heel height that is not excessive (under 5 cm).

Note: A number of studies have shown that wearing athletic shoes can reduce plantar pressure and lead to fewer calluses. The simplest intervention for a patient who is at risk for ulceration would be a good-fitting, well-cushioned pair of athletic shoes if the patient's foot fits well in the upper area.

Provide patient education

Patient education about the importance of appropriate footwear choices is critical for the prevention of diabetic foot ulceration and possible amputation. In addition to the points already discussed, patients should be advised to:

- change their shoes twice daily
- ensure shoes are in a good state of repair
- check shoes for foreign objects before putting them on.

Provide patients with guidance on how to buy new shoes. (See *Tips for buying shoes for patients with diabetes*.) ■

Nancy Morgan, cofounder of the Wound Care Education Institute, combines her expertise as a Certified Wound Care Nurse with an extensive background in wound care education and program development as a nurse entrepreneur.

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Who can perform sharp wound debridement?

By Bill Richlen PT, WCC, DWC, and Denise Richlen, PT, WCC

Nurses and therapists often wonder if their license permits them to perform sharp wound debridement. Scope of practice varies significantly from state to state, so it's imperative to check your state for specific guidance, but we can address some of the challenges clinicians face in deciding whether they can perform this valuable service for patients.

Sharp debridement vs. other forms

In general, clinicians can perform wound debridement using mechanical, enzymatic, chemical, biological, and autolytic means as long as their scope of practice includes wound care. These noninvasive forms of debridement aren't highly technical, so they don't require a specific skill set.

In contrast, sharp debridement is an invasive procedure and requires the ability to use scalpels, sharp curettes, and scissors safely and effectively. This type of debridement is divided into two types — surgical and conservative. Surgical sharp debridement refers to debriding "into" viable tissue, while conservative sharp debridement refers to "up to" viable tissue.

Sharp debridement policies and procedures

Facilities should have policies and procedures for sharp debridement. The *policy* should address who can perform it, what qualifications are required, and what level of supervision is needed. The acronym LACEE may be helpful in developing the policy statement:

- **L**icensure
- **A**ccreditation
- **C**ertification or competency
- **E**ducation
- **E**xperience.

Other items to include are whether the procedure needs to be performed under sterile or clean technique, if a signed consent is required from the patient, and the criteria for appropriate documentation.

The step-by-step *procedure* should outline:

- instruments to be used
- pain and bleeding management
- tissue disposal
- proper dressing application upon completion.

The procedure will then promote uniformity among clinicians who perform sharp debridement.

Scope of practice

In all states, surgical and conservative debridement fall under the scope of practice for physicians, nurse practitioners, and physician assistants. Physical therapists, physical therapy assistants, occupational therapists, certified occupational therapy assistants, and nurses (both registered nurses and licensed practical/vocational nurses) are allowed to perform conservative sharp debridement in some, but not all, states.

What if you are licensed in a state that doesn't address if you can perform sharp debridement? In this situation, you should use a decision tree or algorithm to determine whether you can proceed. Some questions to ask are:

- Did my wound care training prepare me for debridement and am I competent to provide this service? Remember that in addition to the skill, you need to know how to manage the patient's pain and bleeding.
- Will I be providing this service under the supervision of a prescribing clinician who has expertise in debridement?
- Does my facility allow me to perform this procedure? (See *Sharp debridement policies and procedures*.)

The answers will help you make the best decision for you and your patient.

For more information or examples of policies, email the authors at cutabove@sharpdebridement.com. You can also **download a sample policy**[A]. ■

Bill Richlen is the owner of Infinitus, LLC, in Santa Claus, Indiana. Denise Richlen is an area manager for Paragon Rehabilitation.

Note: This article is intended to provide general information. For specific legal questions, contact an attorney.

Online Resource

A. woundcareadvisor.com/wp-content/uploads/2016/07/PP-Debridement-tool.pdf

Preparing the wound bed: Basic strategies, novel methods

Proper preparation promotes optimal outcomes.

By Kulbir Dhillon, NP, WCC

The goal of wound-bed preparation is to create a stable, well-vascularized environment that aids healing of chronic wounds. Without proper preparation, even the most expensive wound-care products and devices are unlikely to produce positive outcomes.

To best prepare the wound bed, you need to understand wound healing physiology and wound care basics, as well as how to evaluate the patient's overall health and manage wounds that don't respond to treatment. (See *Normal wound healing*.)

Basic wound care: DIME

To choose the right method of wound-bed preparation for a particular wound, first assess your patient's condition, wound history, physical wound characteristics,

and availability of resources. Local wound-bed preparation factors can be summarized by the acronym DIME—**D**ebridement, **I**nfection or **I**nflammation, **M**oisture balance, and **E**pithelial advancement. These four components address the various pathophysiologic abnormalities underlying chronic wounds.

D: Debridement

Nonviable tissue must be debrided because cell debris impairs healing. Research and clinical evidence show that debriding necrotic or fibrous tissue accelerates wound healing. (See *Types of debridement*.)

I: Infection or inflammation

Bacterial load directly impacts wound-bed preparation. Assess and treat the patient's wound for superficial or serious infection, persistent inflammation, extensive colonization, and cellulitis. With infection or inflammation, wound healing stalls because the extracellular matrix and growth factors degrade more rapidly than they synthesize, impeding progression toward the proliferative phase and ultimately affecting re-epithelialization. Managing the bacterial load with local or systemic therapy is crucial to wound-bed preparation.

M: Moisture balance

Appropriate moisture promotes the action of growth factors and cytokines and aids migration of cells, including fibroblasts and keratinocytes. However, attaining a moisture balance is challenging. Excessive moisture can damage the wound bed and surrounding skin, leading to maceration and skin breakdown. Inadequate moisture, on the other hand, can impede cellular activities and promote eschar, resulting in poor wound healing.

Normal wound healing

Wound healing involves a complex series of physiologic and pathologic events, including:

- cell division
- revascularization
- synthesis of new extracellular matrix (ECM)
- tissue formation and remodeling.

Soluble mediators, such as growth factors, cytokines, matrix metalloproteinase, and their regulators control many of these processes through their effects on various cell types and ECM.

Wound healing occurs in four overlapping but well-defined phases—hemostasis, inflammation, proliferation, and remodeling. In chronic wounds, this normal process is disrupted.

Be sure to evaluate the patient's nutritional status, cardiac and peripheral vascular status, and renal function. Check for risk factors that can cause moisture imbalance. Then identify an appropriate treatment plan. To increase compliance, explain planned interventions to patients and their caregivers. The typical plan includes medical wound management strategies, such as manual lymph drainage, compression devices and garments, absorptive dressings, and negative pressure wound therapy.

E: Epithelial advancement

Cellular dysfunction and biochemical imbalance can stall wound-bed progression by impeding epidermal cell and keratinocyte migration. Migration of epidermal cells and keratinocytes indicates the wound bed is adequately prepared. Wound contraction is another key sign of an adequately prepared wound bed.

Assessing the patient's overall health

Remember—you must treat the patient before you can treat the wound. Especially

Types of debridement

Autolytic, enzymatic, surgical, mechanical, or biological methods can be used to debride nonviable contaminated and infected tissues.

- *Autolytic debridement* uses the body's inherent ability to digest and remove necrotic tissues by promoting a moist wound environment that allows endogenous enzymes or phagocytic cells to liquefy such tissues. To some extent, all wounds go through autolytic debridement. Such debridement is slow, selective, painless, and noninvasive. However, it's not recommended for infected wounds and isn't the best choice for wounds with a large amount of necrotic tissue.
- *Enzymatic debridement* uses manufactured enzymes, such as collagenase, as debriding agents to dissolve necrotic tissue. Collagenase enzyme is safe on viable cells and can be combined effectively with moist wound healing. Like autolytic debridement, it's a slow method.
- *Surgical debridement* is indicated for wounds with extensive or adherent necrotic tissues. Chronic non-healing infected wounds may require surgical debridement down to the level of bone or muscle. The fastest way to create an acute healing phase, this method allows accurate assessment of wound severity and extent. It's particularly useful in life- or limb-threatening infections with necrotic eschar or gangrene.
- *Mechanical debridement* is a nonselective method that removes debris physically by separating nonviable tissues from the wound bed when the dressing is removed. A wet-to-dry dressing is the simplest form of mechanical debridement. Hydrotherapy (pressure irrigation) and whirlpool therapy loosen and help remove nonviable tissues, debris, and exudates. Mechanical debridement isn't recommended for wounds with fragile granulation.
- *Biological debridement* uses sterile maggots to digest slough and necrotic tissues and secrete bactericidal enzymes without damaging surrounding healthy tissue. Known for centuries to help heal wounds, maggots recently have made a comeback and are garnering renewed interest in biosurgical debridement. Biological debridement is a secondary debridement method for patients who aren't eligible for surgical debridement.

with difficult wounds, multiple comorbidities can delay or interrupt re-epithelialization. Adequate nutrition and smoking cessation are especially important. (See *How smoking and poor nutrition impair wound healing*.)

Checking for wound-specific problems

Assess the patient for two wound-specific problems—biofilms and abnormal matrix.

- *Biofilms* delay wound healing by creating a host-pathogen environment that promotes cohabitation of many bacterial species and anaerobes. These bacteria promote their own survival within the wound environment. Elderly patients and those with complex diseases, diabetic foot ulcers, venous leg ulcers, or pressure ulcers may develop extensive bacterial populations. That's why restoring bacterial balance is important in managing chronic wounds. Techniques for managing biofilms effectively include use of topical agents or systemic antibiotics and regular maintenance debridement.
- *Abnormal matrix* can develop in chronic wounds containing proteases that digest fibronectin and growth factors in the fibrin clot, causing a degraded matrix that no longer supports re-epithelialization or formation of granulation tissue.

Managing wounds unresponsive to treatment

Cells in chronic wounds become unresponsive, unable to divide or respond to such messengers as cytokines and growth factors. This results in phenotypic dysregulation. For successful wound-bed preparation, options may include bioengineered skin-cell therapy, stem-cell therapies, and platelet-rich plasma (PRP) for cutaneous wounds.

Bioengineered skin-cell therapy

Bioengineering treatments have provided viable therapeutic options, especially in managing chronic or difficult-to-heal wounds. Bioengineered skin and soft-tissue substitutes can be acellular or cellular.

Acellular products contain a matrix or scaffold composed of such materials as collagen, hyaluronic acid, and fibronectin. These products differ in various ways, including:

- species source (human, bovine, or porcine)
- tissue source (such as dermis, pericardium, or intestinal mucosa)
- additives (for instance, antibiotics or surfactants)
- hydration (wet or freeze-dried)
- required preparation (multiple rinses or rehydration).

Cellular products contain living cells, such as fibroblasts and keratinocytes within the matrix. Cells within the matrix may be autologous, allogeneic, or derived from other species (such as sheep or pigs). Skin substitutes also may be composed of dermal cells, epidermal cells, or a combination and may provide growth factors to stimulate healing. Topical growth factors are used as an adjuvant treatment to such therapies as debridement, off-loading, frequent dressing changes, and compression of wounds caused by vascular insufficiency

Stem-cell therapy

Use of stem cells in tissue regeneration has significant potential in cutaneous wound-bed preparation. Stem cells act in several ways to aid wound repair; in chronic wounds, they

How smoking and poor nutrition impair wound healing

Patients who smoke or have a poor nutritional status may experience poor wound healing.

Smoking

Smoking disrupts the normal healing process by damaging arterial endothelial function at many levels, decreasing cell proliferation and migration. Smoking also has a direct cutaneous effect, reducing cutaneous blood flow up to 40%; this can cause ischemia and impair healing. Smoking a single cigarette causes vasoconstriction for up to 90 minutes; smoking a pack leads to tissue hypoxia lasting an entire day.

To achieve positive outcomes, assist patients with smoking cessation and promote revascularization of ischemic wounds. The goal is to achieve a well-perfused wound bed and increase viability of active growth factors within the wound bed.

Poor nutritional status

Low protein intake can impede tissue granulation. To promote wound healing, optimize the patient's nutritional status by providing adequate protein.

Also, impaired glucose metabolism reduces the ability of erythrocytes to deliver oxygen to the wound bed—a fundamental step in collagen synthesis and tissue proliferation. A high level of hemoglobin glycosylation prolongs the inflammatory phase, decreases neutrophils, and reduces macrophage phagocytosis of bacteria, all of which directly affect wound-bed preparation. Encourage patients to eat a healthy diet. For those with diabetes, stress the importance of adhering to the treatment regimen.

could serve as an additional tool for therapeutic augmentation. This combined mode of repair and regeneration probably explains why cell therapies are more effective than simpler alternatives, such as direct growth-factor therapy treatment.

PRP

Multiple studies since the 1990s have shown promising results for PRP. For instance, researchers found PRP gel accelerates bone regeneration and studies confirmed the presence of specific platelet-derived growth factor receptors (PDGFs) in bone tissue. Research has uncovered strong evidence that these therapies are effective.

The PRP gel aids molecular and cellular induction of normal wound-healing responses, similar to platelet activation. In addition, PRP contains several growth factors and other cytokines that stimulate healing of bone and soft tissues. Autologous PRP is an advanced wound therapy used for hard-to-heal acute and chronic wounds.

Growth factors such as topical PDGF can help correct matrix abnormalities of growth factors. Also, studies have found that accelerated wound healing follows topical application of epidermal growth factor derived from the patient's own cultured keratinocytes, delivered in a fluid compress.

A systematic approach

When preparing the patient's wound bed and managing the wound, use a systematic approach that helps remove barriers to healing. Proper preparation helps ensure optimal patient outcomes. ■

Kulbir Dhillon is a nurse practitioner and wound care specialist with VA HBPC in Sacramento, California.

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Clinician RESOURCES

This issue we focus on resources you can share with your patients.

Wound patient's bill of rights

The Association for Advancement of Wound Care has developed the "**Wound Care Patient's Bill of Rights**[A]." The 10 points include the right to:

- know what wound treatment options are available to you
- know the benefits, risks, and side effects of your wound care treatments
- participate in the development of your treatment plan with your wound care team
- have your pain adequately controlled.

The bill of rights is available in both English and Spanish.

Infection prevention brochure

"**Win the Battle Against Infection**[B]," from the Association for Advancement of Wound Care, is an ideal tool for enlisting patients in the effort to prevent infection. The brochure, which can be downloaded as a PDF at no charge, answers questions such as:

- What is a wound infection?
- What does a wound infection look and feel like?

- Is my wound infected?

The brochure also provides:

- strategies for preventing infection. Handwashing is well covered, with step-by-step instructions.
- instructions on when to contact the healthcare provider, for example, "if you have uncontrolled bleeding from your wound."

Healthy feet

The Canadian Association of Wound Care devotes a section of its website to "**Diabetes, healthy feet, and you**[C]."

One particularly valuable section is "**Your personal foot care plan**[D]," which includes two forms that can be downloaded:

- Steps for healthy feet checklist
- Your personal plan for change.

Patients who access the information online can follow easy instructions to enlarge the text—helpful for those with impaired vision.

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★ **Catch a BUZZ.** The Buzz Report is where you'll find out what's hot in wound care, including new products, guidelines, resources and tools. It's an information-packed session that, just by itself, is worth the trip.

★ **Improve your skills.** Elevate your clinical skills thanks to a powerful lineup of interactive and advanced how-to sessions, along with plenty of hands-on workshops. You'll get to participate in product training with industry experts that will advance your knowledge of wound care technologies.

★ **Meet your people.** Sure, online interaction is great, but nothing – and we mean *nothing* – beats meeting talented colleagues face-to-face and in person. WOW provides the kind of networking opportunities that allow you to truly engage with others in a meaningful way.

★ **Tax deduction opportunity!** You can write off your travel expenses if attending the WOW Conference benefits your business or contributes to your continuing education. More details visit: www.irs.gov/taxtopics/tc511.html

★ **Have fun.** Wound care is serious business. Whether it's staying abreast of healthcare reform changes or learning about new treatment guidelines, being the best at what we do is paramount. And giving yourself the gift of this conference and everything it offers is a tangible way to revitalize, reenergize and find your wound care mojo.

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Preventing falls at home

Clinicians who work with older patients in the home setting may want to pass along **resources to prevent falls**[E] from the Centers for Disease Control and Prevention. These include:

- "What you can do to prevent falls," available in English, Spanish, and Chinese
- "Check for safety," which patients can use to identify and eliminate fall hazards in their home.

Medication guides

Patients can **download PDFs**[F] of medication guides from the Food and Drug Administration website.

The guides are written in patient-friendly language and contain tips that can help patients avoid serious adverse events. ■

Online Resources

A. aawconline.org/wound-patientcaregiver-resources/

B. aawconline.org/wp-content/uploads/2016/04/AAWC-Infection-brochure_03.06.pdf

C. cawc.net/en/index.php/public/feet/

D. cawc.net/en/index.php/public/feet/record/

E. www.cdc.gov/steadi/patient.html

F. fda.gov/Drugs/DrugSafety/ucm085729.htm

Note from Executive Director

By Cindy Broadus, RN, BSHA, LNHA, CLNC, CLNI, CHCRM, WCC, DWC, OMS

National Alliance of Wound Care and Ostomy®

In previous articles for this series, I introduced you to members of the NAWCO Certification Committee. This article concludes introductions to the 15 members of the committee, but watch for more in this series about certification.

Jennifer J. Brokaw, RN, WCC, OMS

Jennifer is a member of the wound ostomy team at Tampa General Hospital (TGH) in Florida. With more than 20 years of patient care experience (18 years as a registered nurse), Jennifer has practiced in nearly every level of acute care medicine, including med-surg, cardiac-telemetry, and critical care. She was a travel nurse for 8 years, which helped her gain invaluable perspectives through her work at many facilities across the country.

Jennifer was first certified in wound care in 2001, when she became the sole wound care nurse for a 300-bed acute care facility and a 200-bed long-term care facility. There she built the inpatient wound care program from the ground up, including policy and procedures, product formulary, and staff education development. Jennifer has spoken at local colleges and association meetings, and she is a presenter for the nurse residency program at TGH. She is active in the wound ostomy field and sees an average of 50 new patients a week. Jennifer, who is an approved preceptor for WCC candidates, enjoys sharing her knowledge and experience as a wound and ostomy nurse, while continuously expanding her own skills and education. She joined the certification committee in March 2016.

Dianna "Dee" Dashner, BSN, RN, WCC, CLNC, LLE

Dee currently works in an outpatient wound care center in Stuart, Florida. In 2015, she earned her bachelor of science degree from Kaplan University, graduating summa cum laude, and is currently continuing her education at Kaplan by pursuing her master of science in nursing as a family nurse practitioner. Dee has 13 years of nursing experience, with 10 years of wound care experience. She became certified as a WCC in 2009, a CLNC in 2010, and a LLE in 2013. She is a member of Sigma Theta Tau International Honor Society for Nurses, Florida Nurses Association, Alpha Beta Kappa Honor Society, National Association of Wound Care, and National Alliance of Certified Legal Nurse Consultants. Dee joined the certification committee in March 2016.

Jeff Dixon, BS, LPN, WCC

Jeff received his LVN/LPN through the U.S. Army Medical Department Center and School in 2001, and earned his bachelor of science degree in 2015. His clinical experiences include hyperbaric medicine, pediatric emergency, pediatric ICU, neonatal ICU, outpatient surgery, and medical evacuation. Jeff has been an instructor for emergency medical technician training, prehospi-

tal trauma life support, and combat medicine. His passion for wound care has driven him to find better and more cost-effective ways to heal wounds in his community. Jeff is currently the wound care coordinator for Van's Medical Equipment of Lakeland. He manages negative-pressure wound therapy, specialty dressings, and training throughout his region. Jeff became wound care certified in 2015 and joined the WCC Certification Committee in 2016.

Mary Josephine M. Famorca, MAN, BSN, RN, WCC, COCN

Mary is a wound and ostomy certified registered nurse with varied experiences in both clinical practice and nursing education. She has a master of arts in nursing with a specialty in adult health nursing and more than 27 years of nursing experience, including neurosurgical nursing, research, teaching undergraduate and graduate nursing students, and managing a college of nursing and skilled nursing facility. Her experience in both long-term and acute-care settings includes leading interdisciplinary teams and skin champions in lowering the percentage of hospital-acquired pressure ulcers and managing wound/ostomy clients. Mary has presented at local, national, and international levels for professional organizations. Her philosophy is, "It is more enriching to serve than to be served." Mary joined the certification committee in March 2016.

Beth Hoffmire Heideman, MSN, WCC, DWC, OMS

Beth received her BSN and MSN degrees from D'Youville College in Buffalo, New York; a New York State (NYS) teaching certification from Buffalo State College; and creative studies certification from Buffalo State College. She is a member of the American Professional Wound Care Association. Beth has worked as a home care nurse for more than 20 years and is currently practicing as a WCC and OMS for McAuley Seton Home Care/Catholic Health Care System in Buffalo, New York. Before joining the Catholic Health Care System, she taught both high school and an adult vocational program for licensed practical nursing, worked with hospice home care in a variety of clinical roles, and served as an exam item writer for NCLEX. Beth has participated in the Medicaid Gold Stamp program for pressure ulcer reduction in NYS, served on the NAWCO DWC Certification Committee, and is an active member of the WCC Certification Committee. She has been a presenter at the Wild On Wounds (WOW) conference and has had articles published in *Nursing Management* and *Wound Care Advisor*. Beth joined the DWC Certification Committee in 2012 and the WCC Certification Committee in 2013.

Lisa M. Hezel, ADN, BA, RN, ACHRN, DAPWCA, WCC, OMS

Lisa's biggest claim to fame is that she has been a nurse for more than half her life. She graduated in 1993 with her associate degree in nursing and started her career in wound care on May 1, 2000. On that day, she found her official niche in nursing—wound care. Lisa earned her bachelor degree in management communication with a minor in healthcare administration while working full time and raising her young family; she graduated cum laude in 2005. She became a WCC in 2007 and moved into her current job, working as the nurse manager of the Mercy Hospital St. Louis Hyperbarics and Wound Care department, in 2008. She became a certified hyperbaric technologist in 2010 and an advanced certified hy-

perbaric registered nurse in 2014. In preparation for expanding her current department to include an outpatient ostomy clinic, Lisa also became an Ostomy Management Specialist in 2015.

Lisa has been honored as a finalist for *St. Louis Magazine's* 2015 Excellence in Nursing award and was nominated for a Daisy Award for Nursing Excellence in 2016. She was a guest presenter for the St. Louis Nurses in Advanced Practice 2014 Symposium. Lisa is a member of NAWCO, Baromedical Nurses Association, Undersea & Hyperbaric Medical Society, and the American Professional Wound Care Association. She loves her faith, her family, and being a nurse. Lisa joined the certification committee in March 2016.

Jose Roberto "Jojo" Quiva Melendres, RN, WCC

Jose is an RN Case Manager III, working with medically complex patients in a managed care setting. He is wound care certified and currently working on his case management certification as well as licensure in medicine to practice as a physician in the United States. Jose earned a bachelor of science in public health and a bachelor of science in nursing. He also graduated with a degree of doctor of medicine and completed a surgical residency program for which he served as the chief resident during his senior term in the Philippines.

Wound care is just one of his many areas of expertise. Jose migrated to the United States in 2009 with his family. He left his successful budding practice as a general and cancer surgeon and professor in an undergraduate nursing college. Since moving to the United States, he has worked in various healthcare settings in the Sacramento region. Currently he works for Molina Healthcare of California, a nationally recognized managed care business. Jose joined the certification committee in March 2016.

Valeska Martin, RN, CNE, WCC

Valeska is the director of wound care at Brookdale Senior Living Inc., which serves more than 1,100 post-acute care facilities. She has more than 17 years of experience in nursing, beginning as a nursing assistant. Her positions in long-term care include director of nursing, treatment nurse, regional director of quality services, and quality services consultant. Valeska's experience as a treatment nurse prompted her to expand her wound care knowledge by becoming a WCC and obtaining her wound care certification through NAWCO. Currently she assists with monitoring wound outcomes, developing wound care formularies, and developing and presenting extensive wound care training for the associates at Brookdale Senior Living. Valeska enjoys sharing her knowledge within the community to ensure that the residents receive quality preventative and, if necessary, wound therapy and appropriate care plans; she also is involved in programs to maintain compliance with Medicare, Medicaid, and state standards. Valeska joined the certification committee in 2016.

You've now met everyone on the committee. As you probably noticed, we added a number of new members this year in anticipation of continued growth and future endeavors. What a well-rounded group of professional clinicians! NAWCO is excited to have this great team of individuals on the certification committee.

I would like to take this opportunity to thank all our committee members for their efforts, the time they volunteer, and the great job they are doing.

New certificants

Below are WCC, DWC, and OMS certificants who were certified from April 2016 to May 2016.

Ronila Aldeguer
Ashley Anderson
Alisa Anderson
Deborah Anson
MaryGrace Antonio
Dominic Arbeitman
Abegail Arca
Richard Ashby
Michelle Ashby
Ann Avery
Bernadette Bailie
Robert Baird
Sejal Bamrolia
Eudelia Banda
Keesha Banwarth
Mary Beach
Heather Beall
Jenifer Bibler
Amy Bierwirth
Sunday Bloodworth
Valerie Bonifant
Timothy Bowers
Jeanna Bracken
Cynthia Broadus
Maria Brockway
Sherlita Broomfield
Lauetta Brown
Angela Bryant
Amy Burkhead
Robin Burns
Emily Butler
Rogelio Buyo
Denise Carter
Katie Challacomb
Juan Chavez Duarte
Julianne Ciaglia
Cynthia Clemency
Shelly Cochran
Shannon Cook
Mary Cooley-Comvalius
Joffre Cuenco
Colleen Cyr
Mary Daniels
Lynn Deaton
Chansamone Dee
Geraldine Del Valle
Kristen Devick
Pauline Dickens
Terri Dixon
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Bridgette Dollhopf
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Elizabeth Dowell
Nancy Dreher
Trisha Dubois
Shannon Dudash
Emily Dyce
Trisha Eibel
Vicki Ellis
Darlene Engel
Katherine Ferrell
Deborah Finch
Georgia Fisher
Kendra Fling
John Ford
Angela Fortson
Mary Francl
Theresa Frankie
Shelli Freeman
Stefanie Fuller
Audrey Garcia
Jose Gasca
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James Gawel
Karen Genter
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Dean Gorospe
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Anoop Grewal
Lissette Grillo
Cara Gunter
Denise Gunter
Marie Haddock
Kenye Hampton
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Elizabeth Harlow
Vickie Harvey
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Diane Hecht
Kimberly Held
Magdalena Hennessy
Debra Hermann
Kimberly Hightower
Lori Hinchee
Casey Hinman
Stacey Hiser
Vickie Hodes
Kimberly Jarvis
Jacqueline Johnson
Aida Johnson
Elizabeth Jones
Cheryl Jones
Anitha Kadiranagaripalli
Esther Kamau
David Kauffman
Parminder Kaur
Angela Kemp
Kari Kesner
Miyuki Kiba
Sheila Kihlthau
Nona King
Jerome Kochinsky
Joyce Kodama
Bridget Kohlhaas
Mechelle Krause
Megan Kroll
Katherine Kunkel
Allison La Voie
Rachel Lail
Shehroz Lakhani
Celeste Laney
Sarah Larson
Lora Latendresse
Lora Latendresse
Cathy Laubenthal
Sarah Lauersdorf
Jamie Lawson
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William Leskovec
Kary Levaugh
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Yuling Liu
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Rachel Mamere
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Laurie Martinez
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Gina McEachern
Roxann Mekus
Rebecca Miller
Lala Miner
Myroslava Mokliak
David Mundhenk
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Ronald Noack
Chioma Nwabude
Kathryn O'Bryant
Margaret Oesterreich
Jayne Osadho
Margaret Ovando
Kimberly Owen
Dorotha Owens

Aura Palma
Shannon Parish
Khara Paschal
Gloria Patterson
Dawn Pederson
Ann Perillo
Edward Perry
James Pineda
Cynthia Plummer
Krysta Pryatel
Jessie Quiles
Paula Raggio
Emma Regular-Galarrita
Ma Lucille Reyes
David Richards
Jennifer Riegel
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Sonia Robinson
Jaquetta Romero
Pelaghia Rosca
Pamela Rose
Lilah Russell
Sylwia Ryba
Jona Sarte-Estalilla
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Tshaye Scarlett
Jami Schaefer
Diane Scheuher
Vicki Scheuher
Christine Schroeder
Sarah Schumann
Marquita Scott
Priscilla Seith
Janie Shepherd
Christina Signs
Paul Simpson
Trisha Skirvin
David Slattery
Deborah Smith
Alan Smith
Sarah Snow
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Gloriangeles Soule
Pamela Spiker
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Jennifer Villacorta
Terra Vineyard
Amanda Wade
Karen Walk
Teri Waller
Piyaporn Walls
Susan Weber
Nathan Weirauch
Brenda Wells
Jean Wendland-Porter
Yvonne White
Trella White
Julie Whitehouse
Sarah Whitehurst
Asha Wilborn
Deloria Williams
Nicole Wilson
Shannon Wolfelperger
Teresa Wooten
Clara Wukelich
Leonard Yang
Brian Yendrek
Xue Zhu

Recertified certificants

Below are WCC, DWC, and OMS certificants who were recertified from April 2016 to May 2016.

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Darcy Albrecht
Geralyn Albright
Sherronda Alexander
Carrie Allen
Earl Je Alquizalas
Angela Altman
Michelle Araki-Ikeda
Angela Arbelaez
Karen Asman
Nyrie Austin
Sandra Bails
Rebecca Bastain
Cathleen Bastible
Jyotirmayee Battar
Angela Beek
Claudia Boehnisch-Reiser
Elizabeth Boes
Shannon Boyes
Julie Brabant
Leona Breakall
Dell Brown
Vanessa Brown
Lori Brown-Duncan
Stephanie Burns
Marzena Cabrera
Darsi Callaway
Terra Cameron
Angel Carlson
B Carter
Julie Cebina
Gayle Chaney
Elise Chapman
Wendy Chow
Gina Clark
Shirley Clarke
Amy Clason
DonnaLee Clough
Maria Comillas
Michelle Cox
Pamela Cox
Jenny Cruz Padilla
Tricia Dausener
Deborah Day
Jessica Delano
Kathryn Dettle
Joanne Dietz
Deborah Disney
Leslie Doepker
Jessica Dominguez
Carol Dunn
Rhonda Earley
Janet Eden
Barbara Egelman
Luis Ehrman
Marie Hope Enad
Wendy Eppers-Ott
Chileen Eze
Sigrid Feldbrugge
Jolinda Ferrell
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Anita Finney
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Claudia Gallardo
Jennifer Gammon
Svetlana Ganaga
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Kathleen Garner
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Laraika Gibbs
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Amber Griffin
Amy Griffith
Diane Guarini
Tatyana Gurevich
Michelle Hainline
Athena Hallock
Kim Harding-Paone
Dianne Harris
Steven Hartung
Teresa Hebert
Renee Hernandez
Joanna Hersick
Leah Hillenburg
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Bonnie Huth
Lea Jacuzzi
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Erin Johnson
Heidi Johnson
Cheryl Jones
Natalie Karber
Christina Kenter
Janelle Kettering
Donna Klein
Shawn Klett
Renata Kociubinski
Amy Koehler
Aimee Larracas
Sandra Leamer Newhouse
Laureen LeBlanc
Patricia Lipus
Jamie Lytle-Holcomb
Vitae Magana
Danyelle Maida
Rowena Malolot
Kimberlene Manbahal
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Donna Musser
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